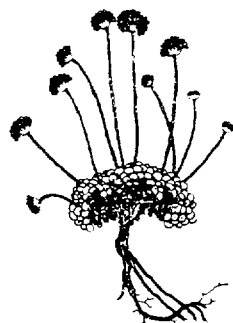
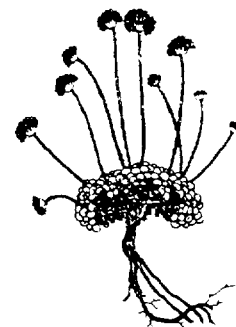
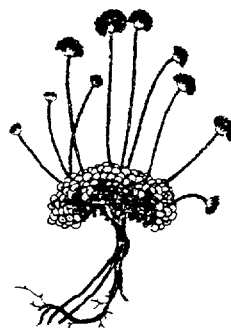
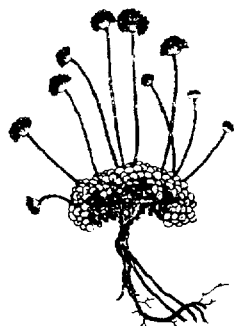
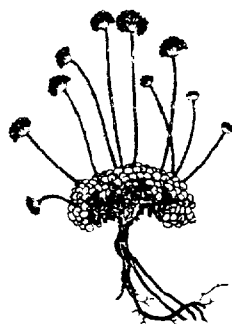
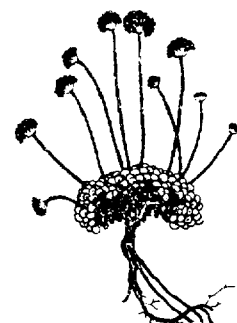
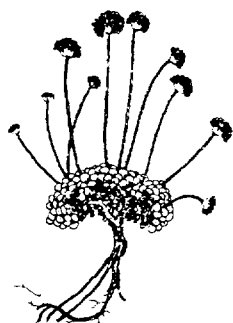
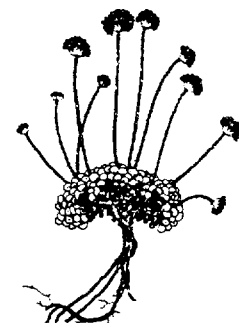


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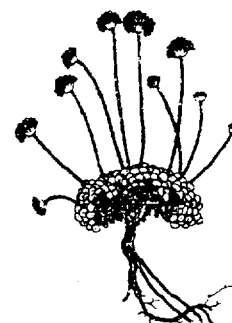
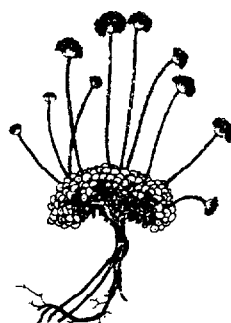
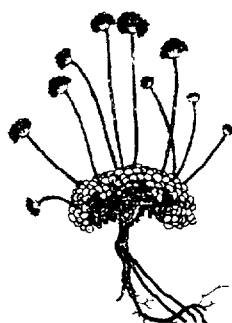
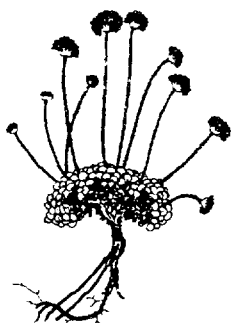
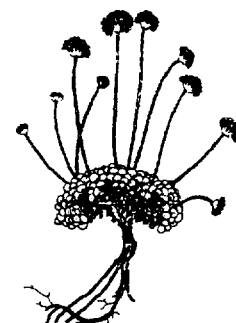


# STEAMBOAT BUCKWHEAT

## RECOVERY PLAN



U.S. Fish and Wildlife Service  
Region 1  
Portland, Oregon



**STEAMBOAT BUCKWHEAT**  
**(*Eriogonum ovalifolium* var. *williamsiae*)**

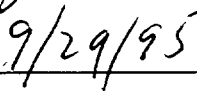
**RECOVERY PLAN**

U.S. Fish and Wildlife Service  
Region 1  
Portland, Oregon

Approved: \_\_\_\_\_

  
Regional Director, U.S. Fish and Wildlife Service

Date: \_\_\_\_\_



## DISCLAIMER

Recovery plans identify and recommend implementation of reasonable actions which are believed to be necessary to recover and/or protect federally listed threatened and endangered species. Plans are published by the U.S. Fish and Wildlife Service, sometimes prepared with the assistance of recovery teams, contractors, State agencies, and others. This recovery plan has been prepared by Janet Bair, U.S. Fish and Wildlife Service, Nevada State Office, Reno, Nevada. The objectives established in the recovery plan will be attained and any necessary funds made available subject to budgetary and other constraints affecting the parties involved, as well as the need to address other priorities. Recovery plans do not necessarily represent the views, official positions, nor approval of any individuals or agencies involved in the plan formulation, other than the U.S. Fish and Wildlife Service. They represent the official position of the U.S. Fish and Wildlife Service *only* after they have been signed by the Regional Director or Director as *approved*. Approved recovery plans are subject to modification as dictated by new findings, changes in species status, and completion of recovery tasks.

Literature Citation should read as follows:

U.S. Fish and Wildlife Service. 1995. Steamboat buckwheat (*Eriogonum ovalifolium* var. *williamsiae*) Recovery Plan. Portland, Oregon. 32 pages plus appendices.

Additional copies may be purchased from:

Fish and Wildlife Reference Service  
5430 Grosvenor Lane, suite 110  
Bethesda, Maryland 20814  
(301) 429-6403  
or  
1-(800) 582-3421

The fees for plans vary depending on the number of pages.

## **ACKNOWLEDGEMENTS**

The Nevada State Office of the U.S. Fish and Wildlife Service appreciates the assistance provided by the Bureau of Land Management, Nevada Division of Forestry, Nevada Natural Heritage Program, Nevada Department of Transportation, and The Nature Conservancy during preparation of this document. We also appreciate the efforts of industry representatives, private landowners, and other individuals who reviewed and commented on the draft document, as identified in Appendix B. The illustration of Steamboat buckwheat used on the cover was reproduced with permission of the artist, Kaye H. Thorne.

# EXECUTIVE SUMMARY OF THE RECOVERY PLAN FOR THE STEAMBOAT BUCKWHEAT

**Current Species Status:** Steamboat buckwheat (*Eriogonum ovalifolium* var. *williamsiae*) is an endangered plant species known from what appears to be a single population in the Steamboat Hills, in southern Washoe County, Nevada. The taxon is locally abundant, but restricted to appropriate habitat in an area of approximately 100-150 hectares (ha) (250-375 acres [ac]).

**Habitat Requirements and Limiting Factors:** Life history and habitat requirements of Steamboat buckwheat are not fully understood. The plant is endemic to substrates derived from hot spring deposits from a single hot spring system in the Steamboat Hills. Steamboat buckwheat is threatened through habitat loss resulting from a variety of activities, including geothermal resource development, construction, and highway expansion.

**Recovery Objective:** Reclassification to threatened status.

**Recovery Criteria:** Steamboat buckwheat will be considered for reclassification to threatened status when: 1) Protective conservation easements or fee acquisitions secure approximately 75 ha (185 ac) of occupied habitat currently in private ownership; 2) cooperative agreements are established for approximately 32 ha (80 ac) of occupied public lands and approximately 15 ha (37 ac) of occupied State lands within a highway easement; and, 3) comprehensive management plans have been developed and implemented on all occupied habitat. Delisting criteria cannot be determined at this time.

## **Actions Needed:**

1. Protect Steamboat buckwheat habitats from adverse physical modifications.
2. Identify factors limiting long-term population viability of Steamboat buckwheat.
3. Provide public information and education.

## **Total Estimated Cost of Recovery (\$1,000's)**

<u>Year</u>	<u>Need 1</u>	<u>Need 2</u>	<u>Need 3</u>	<u>Total</u>
1996	36 + TBD	18 + TBD	15	69 + TBD
1997	59 + TBD	48 + TBD	4	111 + TBD
1998	5 + TBD	56 + TBD	4	65 + TBD
1999	5 + TBD	12 + TBD	4	21 + TBD
2000	5 + TBD	12 + TBD	4	21 + TBD
Totals:	110 + TBD	146 + TBD	31	287 + TBD

TBD: To be determined.

**Date of Recovery:** Reclassification of Steamboat buckwheat should be initiated in 2000, if recovery criteria are met.

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## **Part I. INTRODUCTION**

### **A. Brief Overview**

Steamboat buckwheat (*Eriogonum ovalifolium* Nutt. var. *williamsiae* Reveal) is a small, densely matted herbaceous plant endemic to substrates derived from hot springs deposits in the Steamboat Hills, located approximately 15 kilometers (km), (10 miles [mi]) south of Reno, Nevada, in southern Washoe County (Figure 1). This taxon is locally abundant, but apparently restricted to approximately 20 hectares (ha), (50 acres [ac]) of plants in an area of approximately 100-150 ha (250-375 ac) on a combination of private and public lands (Knight 1993, BLM 1993). Populations and habitat of Steamboat buckwheat are threatened by a variety of activities, including geothermal resource development, commercial and industrial construction, and highway expansion.

At present, approximately half of the lands on which Steamboat buckwheat occurs is under a 30 year lease by the Steamboat Development Corporation (SDC) for development of geothermal resources. In association with this lease, a formal agreement between The Nature Conservancy (TNC) and SDC was executed to provide protection for Steamboat buckwheat for the duration of the lease. Included within the agreement are commitments for fencing, seed banking, and development of a management plan for protection of Steamboat buckwheat and its habitat. The remainder of the population and its habitat are on private property and public lands managed by the Bureau of Land Management (BLM).

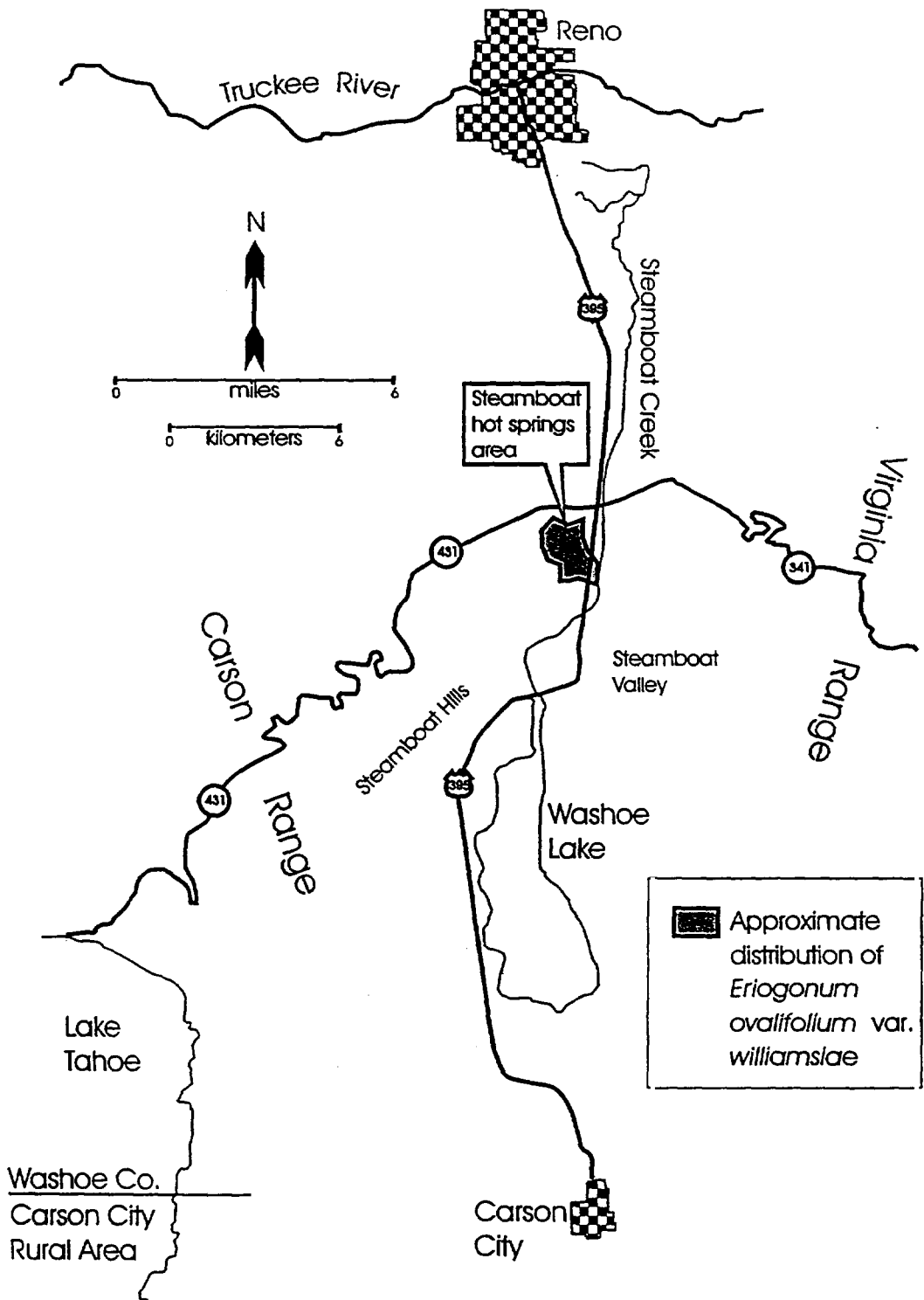


Figure 1: Map of Steamboat Hills and vicinity, showing approximate distribution of Steamboat buckwheat

Steamboat buckwheat was listed as an endangered species without critical habitat by the U.S. Fish and Wildlife Service (Service) on July 8, 1986 (51 Federal Register 24669). The Service assigned Steamboat buckwheat a recovery priority of 3, indicating a high degree of threat, but high potential for recovery. The potential for recovery of Steamboat buckwheat is considered high because Federal and State land management agencies, as well as private entities have expressed interest in working with the Service to develop a range-wide strategy for protection of its habitat.

## **B. Taxonomy and Species Description**

*Eriogonum*, a genus of the buckwheat family (Polygonaceae), is comprised of approximately 250 species in North America, including 74 species native to Nevada (Reveal 1981, 1985). Steamboat buckwheat is one of seven varieties of the species *E. ovalifolium* known from Nevada. The variety *williamsiae* was first collected in 1884 by K.C. Brandegees, but was not recognized as a valid taxon until 1981, when James Reveal (1981) described it as the variety *williamsiae* in honor of Margaret Williams, a founding member of the Northern Nevada Native Plant Society.

Steamboat buckwheat (Figure 2) is a low, densely matted, compact perennial herb, 0.5-4.5 decimeters ([dm], 2-18 inches [in]) across, with numerous, densely-leaved, woody branches. The above-ground portions of the plant arise from a shallow but stout, woody, reddish-brown taproot (usually in older plants), or a shallow, fibrous, rhizomatous root system (in younger plants). Each plant bears numerous oval to reniform leaves congested in tight rosettes. Leaf blades are generally 3-8 millimeters ([mm], 0.1-0.3 in) long, 5-10 mm

(0.2-0.4 in) wide, and are densely covered with greenish-white to tannish-white hairs. Some leaves exhibit a faint brown margin at maturity. Petioles are generally 3-6 mm (0.12-0.24 in) long, woolly, and often wavy or curled. Inflorescences are borne on erect, partly woolly stems, up to 2.5 dm (10 in) long, and are enclosed in cone-shaped involucre covered with densely-matted, woolly hairs. Five to eight involucres are clustered in a head at the top of each stem. Flowers are generally white with a central greenish-brown rib, turning pinkish-tan with age (Reveal 1981; Williams 1982).

No other buckwheat closely resembles Steamboat buckwheat, although herbarium specimens have been misidentified as brown-margined buckwheat (*Eriogonum ovalifolium* var. *eximium*) (Williams 1982), a closely related variety present at high elevations in the northern Sierra Nevada (Hickman 1993). Two other taxa of buckwheat are found in association with Steamboat buckwheat. The most abundant is Wright's buckwheat (*E. wrightii* var. *subscaposum*), another mat-forming taxon, with very narrow, lance-shaped leaves. The other buckwheat, altered andesite buckwheat (*E. lobbii* var. *robustum*) is described in the following section.

### **C. Associated Species of Concern**

Section 4 of the Endangered Species Act of 1973, as amended (ESA) requires the Service to identify species that are endangered or threatened with extinction, after conducting a review of their status. In regulations found at 50 CFR 424.15, the Service advises that it may publish comprehensive notices of review which identify species considered candidates for listing under the ESA.

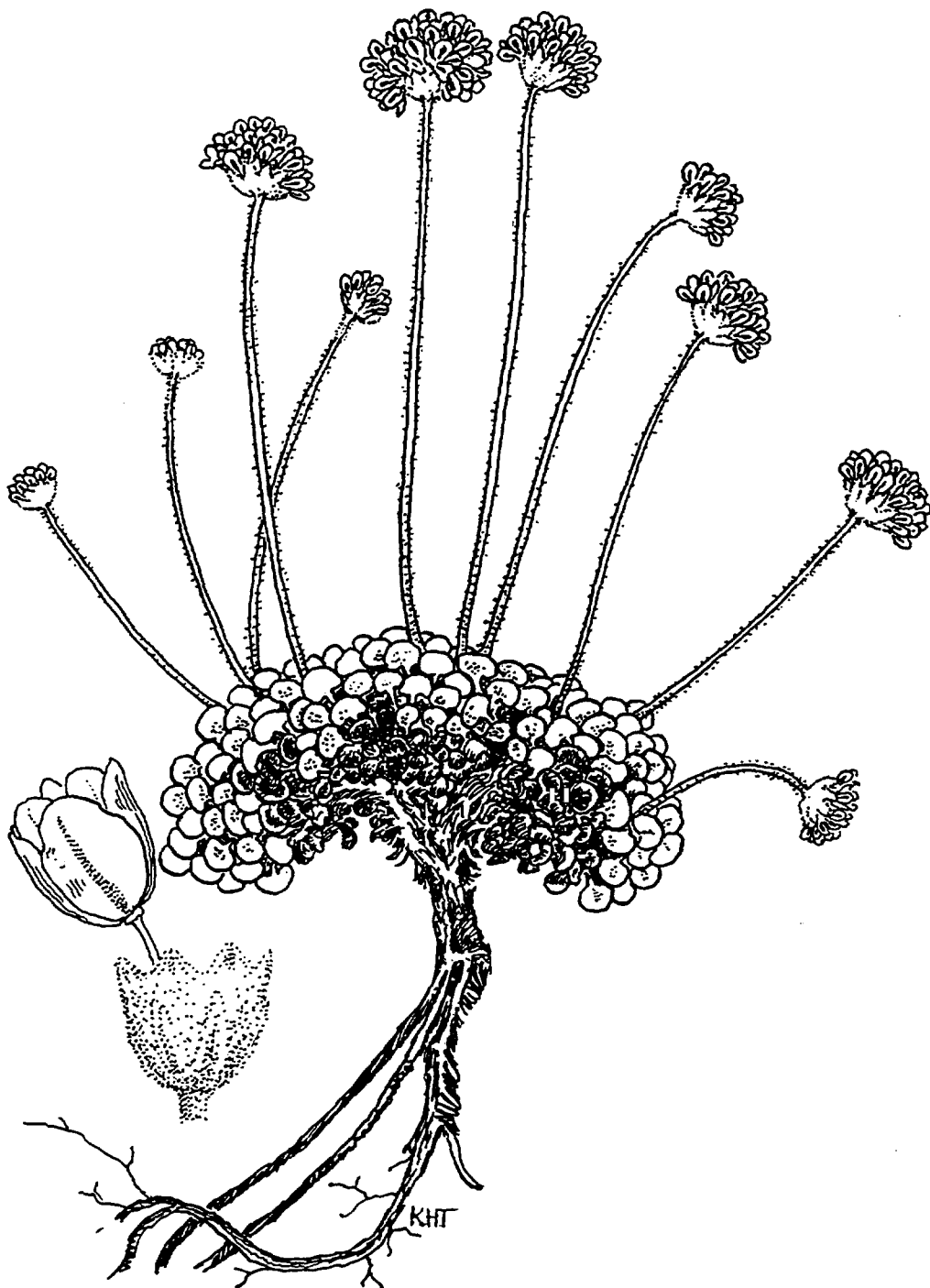


Figure 2. Steamboat buckwheat (Illustration used with permission of Kaye H. Thorne, 1994).

Altered andesite buckwheat is the only other species of concern to the Service occurring in the Steamboat hot springs area. This perennial buckwheat is distinguished from Steamboat buckwheat by its larger, roundish leaves assembled in loose cushions (Williams 1982). Altered andesite buckwheat is largely restricted to outcrops of azonal soil derived from hydrothermally altered andesitic bedrock (Billings 1950), at numerous locations in Storey and Washoe counties, Nevada (Jim Morefield, Nevada Natural Heritage Program, pers. comm., August 1, 1995). The Steamboat hot springs population of altered andesite buckwheat consists of approximately 3,000 individuals occurring within an area of approximately 1.2 ha (3 ac).

Several actions recommended by this recovery plan would also benefit altered andesite buckwheat by protecting or enhancing its habitat in the Steamboat hot springs area. Consideration of altered andesite buckwheat during recovery activities for Steamboat buckwheat may help to avoid the need to list this taxon as threatened or endangered in the future.

#### **D. Distribution and Population Status**

Steamboat buckwheat is restricted to substrates derived from hot springs deposits in the Steamboat Hills. At the time it was listed as an endangered species in 1986, Steamboat buckwheat was thought to consist of a single population of seven colonies, all located within an area of approximately 40 ha (100 ac) (Williams 1982; 51 Federal Register 24669). In an effort to better define its distribution, Steamboat buckwheat was subsequently mapped (CH2M Hill 1986). The information derived from this effort suggests that all known habitat and potential habitat of the buckwheat were restricted to an

area of approximately 150 ha (375 ac) in 1986. Within that area, approximately 20 ha (50 ac) were actually occupied by Steamboat buckwheat plants (BLM 1993). More recent and definitive information on extent and distribution are lacking but will be needed to advance recovery of the taxon.

Numbers of genetically distinct, individual plants are not visibly determinable because Steamboat buckwheat is rhizomatous and apparently propagates, to some extent, by underground runners. A few estimates of individual rosettes have been made in portions of the habitat, in conjunction with planning efforts for SDC and Nevada Division of Transportation (NDOT) projects (Knight 1993, WESTEC 1993, and RCI 1994). The other private properties and the BLM parcels have not been surveyed, and there is no quantitative estimate for the entire habitat. The available information suggests that there are probably tens of thousands of individual rosettes scattered throughout the Steamboat hot springs area (Williams 1982, Knight 1993, WESTEC 1993, RCI 1994). The total number of genetically distinct individuals is likely substantially less, given the probability of rhizomatous connections among individual rosettes.

Steamboat buckwheat occurs on lands under both Federal management and private ownership. On Federal lands, a portion of the population occurs on the U.S. Highway 395 right-of-way, which includes approximately 15 ha (40 ac) of lands on either side of the existing highway where it passes through the Steamboat hot springs area. Steamboat buckwheat and its habitat also occur on portions of the 32 ha (80 ac) of lands under management by BLM in the Steamboat area, including the 16 ha (40 ac) Steamboat Hot Springs Geyser Basin Area of Critical Environmental Concern (ACEC). In

1988, several parcels of Federal lands in the Steamboat Hills were transferred from BLM to Forest Service management under the terms of the National Forest of Nevada Enhancement Act (P.L. 100-550). Federal lands occupied by Steamboat buckwheat were not included in this transfer and remain under management by BLM.

The majority of Steamboat buckwheat and its habitat occurring on private lands, including those lands under the terms of the 30 year lease with SDC for geothermal development, are on the properties of a single land owner. Additional plants and habitat occur on the properties of at least three other land owners.

#### **E. Habitat Description**

The Steamboat Hills are geographically situated on the extreme western edge of the Great Basin Division of the Intermountain Region, at the base of the eastern slope of the Carson Range in the Sierra Nevada. The Great Basin is a high-elevation, mountainous, cool desert characterized by interior drainage basins. The Steamboat Hills range between approximately 1,400 and 1,800 m (4,600 and 5,900 ft) elevation and are characterized by shrubs, including big sagebrush (*Artemisia tridentata*), bitterbrush (*Purshia tridentata*), and rabbitbrush (*Chrysothamnus nauseosus*). Small islands of Sierra Nevada conifers, primarily ponderosa pine (*Pinus ponderosa*) and Jeffrey pine (*P. jeffreyi*), are present in the Steamboat Hills but are restricted to outcrops of hydrothermally altered andesitic bedrock devoid of the more characteristic Great Basin plant species (Billings 1950).

Geologically, the Steamboat Hills are comprised of a topographically prominent bedrock feature surrounded by unconsolidated deposits of



lacustrine sediments with minor interbedded basalt flows (Sorey and Colvard 1992). Rhyolite crops out in three domes, forming a northeast-southwest-trending volcanic feature along which flows of basaltic andesite once erupted. Hydrothermal activity at the Steamboat hot springs may be associated with the magma reservoirs that supplied these eruptions (Silberman et al. 1979).

The Steamboat Hills are an area of significant geothermal activity. The hot springs system has apparently been intermittently active for the past 2.5 million years (Silberman et al. 1979). Various surface hydrothermal features, including geysers, fumaroles, steam vents, hot creeks, and hot pools have been prominent at times in a small area of the Steamboat Hills known as the main terrace (BLM 1983). Until recently, the main terrace area featured the largest concentration of geysers in the United States outside of Yellowstone National Park (BLM 1993). However, a decline in hot springs activity has been observed in the Steamboat area since about 1987, and surface flows (including geyser activity) from the springs ceased in mid-1989. Groundwater declines in the area have been attributed to various causes, including geothermal and fresh-water groundwater pumping, and the recent, multi-year drought (Sorey and Colvard 1992).

Steamboat buckwheat is largely restricted to moderately deep, siliceous hot springs deposits known as sinter (CH2M Hill 1986). The extensive deposits of opal and chalcedony sinter in the Steamboat Hills originated from the discharge of hot-spring waters and thermal ground water saturated with amorphous silica. These deposits overlay unconsolidated alluvium and glacial outwash at depths of up to approximately 25 m (80 ft) (Sorey and Colvard 1992). Steamboat buckwheat has not been found on deep or alluvial soils. It has been

observed, in small numbers, in association with materials recently deposited by active geysers and vents. Moisture available for uptake by Steamboat buckwheat is thought to be derived primarily from precipitation rather than from spring sources (CH2M Hill 1986).

Topographically, Steamboat buckwheat usually occurs in open areas on gentle, east-facing slopes, and occasionally on the tops and steeper slopes of dome-shaped deposits formed by hot springs activity. It is a colonizing species on sinter deposits (Williams 1982), and is one of the first plants to establish as the sinter substrates are leached of high concentrations of soluble chemicals (CH2M Hill 1986). Steamboat buckwheat does not occur on sites with high levels of sodium, potassium, chloride, or alkalinity (CH2M Hill 1986).

As soil development proceeds on the sinter substrates through accumulation of blowing soil and addition of organic matter through decay of plant materials, other plant species invade these sites and compete with Steamboat buckwheat for available space and nutrients. Steamboat buckwheat habitats are relatively low-density and non-diverse with respect to other plant species. Species commonly associated with Steamboat buckwheat include big sagebrush, shadscale (*Atriplex confertifolia*), Great Basin wild rye (*Elymus cinereus*), cheatgrass (*Bromus tectorum*), Wright's buckwheat, greasewood (*Sarcobatus vermiculatus*), snakeweed (*Gutierrezia sarothrae*), and desert saltgrass (*Distichlis spicata*) (Williams 1982, CH2M Hill 1986, Nelson 1991). Steamboat buckwheat is eventually out-competed by other plant species invading the sinter substrates (CH2M Hill 1986).

## F. Life History and Ecology

With the exception of miscellaneous anecdotal information amassed during various survey efforts, very little is known about the life history and biology of Steamboat buckwheat. Williams reported that while some plants have dead or damaged portions, possibly from disturbance in the area, most plants look the same year after year (Williams 1982). Steamboat buckwheat typically flowers during the period mid-May through June, and seed heads remain on the plant through October. Butterflies of the genus *Euphilotes* were observed on Steamboat buckwheat flowers in 1994, although pollination was not documented (Jim Morefield, Nevada Natural Heritage Program [NNHP], pers. comm., May 10, 1994). Individual plants transplanted to containers in the Nevada Division of Forestry (NDF) nursery flowered and produced seed in Summer 1994 (Dan Greytak, NDF, pers. comm., June 30, 1994), suggesting that Steamboat buckwheat may not be dependent on endemic pollinators.

Williams (1982) suggested that the seeds of Steamboat buckwheat are disseminated by wind. Viability of seeds may be quite low. Seed materials of Steamboat buckwheat endowed with the Center for Plant Conservation's National Collection contained less than one-percent live seed (Teri Knight, TNC, pers. comm., June 10, 1994).

Degree and potential declines of genetic variation within the Steamboat buckwheat population as a result of past population destruction or habitat fragmentation have not been assessed. Individual plants exhibit extensive systems of underground rhizomes, and small rosettes are usually found in close proximity to larger rosettes, suggesting clonal propagation may be the predominant

manner of reproduction (Knight 1993). Clonal plant populations in many plant species are frequently multi-clonal and exhibit intermediate levels of genetic variability within a single population (Ellstrand and Roose 1987). Clonal propagation may be the primary mode of reproduction in Steamboat buckwheat, coupled with occasional occurrences of seed production through sexual recombination (Teri Knight, TNC and Jim Morefield, NNHP, pers. comm., May 19, 1994). This strategy could provide a mechanism for increasing genetic variation within the population.

#### **G. Reasons for Listing and Current Threats**

Steamboat buckwheat was listed as an endangered species in 1986 because of its vulnerability to habitat alteration that could be caused by drilling for geothermal development, recreational and commercial development, and mining activities. In addition, Steamboat buckwheat was believed actively threatened at that time by off-road vehicle use, dumping of refuse, and alterations to moisture patterns (51 Federal Register 24669). Today, some of these factors continue to threaten Steamboat buckwheat.

Construction projects resulting in destruction of individual plants, destruction of habitat, or alteration of drainage patterns constitute the greatest threat to Steamboat buckwheat. Past construction activities in Steamboat buckwheat habitat include U.S. Highway 395, the Steamboat branch of the U.S. Post Office, several private residences, and construction of geothermal facilities.

Patches of Steamboat buckwheat growing on the shoulder of U.S. Highway 395 may occasionally be damaged or destroyed by motor

vehicles. Also, individual plants could potentially be damaged or destroyed during vehicular access to the various advertising billboards, powerlines, and other utility easements established within the highway right-of-way. Vehicular access to much of the prime habitat is now restricted by fencing and locked gates, and vehicular trespassing occurs only on an occasional basis. Illegal dumping probably does not occur in the area since fencing has been installed. Alteration of moisture patterns is probably limited to changes in drainage patterns resulting from the various roads or other structures occurring in the habitat.

There are two active commercial geothermal fluid production developments in operation in the Steamboat Hills: the Yankee/Caithness Joint Venture, and SDC. The Yankee/Caithness facility was not constructed within the habitat of the Steamboat buckwheat habitat and therefore poses no direct threat. SDC, however, recently constructed buildings, wells, roads, and utility corridors in Steamboat buckwheat habitat. Approximately 17,000 plants and the substrates they were growing in were removed from the construction zone and transplanted to unoccupied habitats on abandoned road beds, and to local greenhouses, in accordance with a permit issued by the NDF allowing disturbance of Steamboat buckwheat. Transplant success has not yet been documented. Also in accordance with the permit, SDC entered into a 30 year conservation agreement with TNC to mitigate disturbance. SDC's conservation activities are described in Section I, Conservation Efforts.

Future activities with potential to directly disturb Steamboat buckwheat populations and habitat include additional geothermal facility development and power substation modifications. In addition,

NDOT is currently evaluating various alternatives for highway expansion or modification in the Steamboat area, and there is an agreement between Washoe County and the BLM for development of a county park on the ACEC, which would include recreation facilities and interpretive features. Development of the park is currently not a high priority project because surface geothermal features are inactive. However, if the park was developed in the future, it would be designed to enhance and protect, rather than disturb the Steamboat buckwheat population and habitats (Dave Loomis, BLM Carson City District, pers. comm., May 19, 1994). Regardless, park development could lead to further encroachment on the habitat through popularization of the area as a recreational attraction.

There are also potential indirect threats to the habitat of Steamboat buckwheat. Deposition of the siliceous material from which sinter is derived has not occurred since the hot springs ceased flowing in 1989. Water-level declines in the geothermal aquifer have been attributed to various factors including pumping for geothermal production, reduction in groundwater recharge associated with regional declines in precipitation since 1985 (i.e., drought), increases in groundwater wells in the south Truckee Meadows to accommodate commercial and residential development, and conversion of lands from agricultural to suburban use, which has reduced secondary recharge (Nork 1992, Sorey and Colvard 1992).

In the absence of hot spring discharge at ground surface, the sinter substrates required by Steamboat buckwheat will not be produced in the future. In addition, existing sinter will eventually become weathered to the extent that other plant species will invade and out-compete Steamboat buckwheat. If the hot springs remain dry, the

most recently deposited siliceous materials (located adjacent to hot spring vents) will weather and become available for colonization by Steamboat buckwheat. However, all presently existing sinter substrates in the Steamboat Hills will eventually weather beyond conditions suitable for Steamboat buckwheat. The period of time required for this process to occur has not been estimated, although it has been speculated that such a process may require hundreds or thousands of years (BLM 1993).

#### **H. Critical Habitat**

Critical habitat, as defined by section 3 of the ESA, includes: 1) The specific areas, within the geographical area occupied by a species at the time of its listing under the ESA, which contain those physical or biological features essential to the conservation of the species and which may require special management considerations or protection; and 2) specific areas outside the geographical area occupied by the species at the time it is listed, which are determined to be essential for the conservation of the species. At the time Steamboat buckwheat was listed, the Service found that designation of critical habitat was not prudent because it was believed that publication of maps showing the distribution of the plant would make it vulnerable to collection and vandalism (51 Federal Register 24669).

#### **I. Conservation Efforts**

Since 1987, Steamboat buckwheat has been listed as critically endangered under Nevada Revised Statute 527.270. Under the terms of State law, developers are required to obtain a permit from NDF prior to disturbance of state-listed plants on private lands.

As previously discussed, a 45 ha (110 ac) parcel of privately-owned land is under the terms of a 30 year lease by SDC for construction and operation of a geothermal power plant. In accordance with a permit issued by NDF and the terms of the SDC lease, TNC executed the "Agreement to Preserve Steamboat Buckwheat" in 1991 (TNC and SDC 1991). Included within this agreement were stipulations to prepare the "Steamboat Buckwheat Management Plan" for the lease site (Knight 1993). This plan specifies various conservation and protection measures for Steamboat buckwheat and its habitat on the lease site, including site planning to minimize construction impacts; experimental transplants of displaced plants; fencing to protect adjacent sites during construction; site habitat mapping; commitments to short- and long-term monitoring; and research, education, and public outreach activities. Many of the features of the plan have already been implemented, including site evaluation, transplanting efforts, and worker-education programs. Biological inventory and monitoring commenced in 1991 and are expected to continue into the future. The Management Plan also specifies several aspects of the life history, genetics, and ecology of Steamboat buckwheat which should be investigated.

Also in accordance with the agreement between SDC and TNC, Steamboat buckwheat seeds were collected from the site in 1992 and 1993 and sent to the Center for Plant Conservation, for endowment at the Berry Botanic Garden in Portland, Oregon. This effort ensures long-term storage and conservation of the propagules of Steamboat buckwheat. In accordance with the management plan for the lease site, TNC will continue annual seed collection through 1997.



Various conservation actions have been completed for Steamboat buckwheat habitat under management by the BLM, including removal of debris and installation of fencing around the Steamboat Hot Springs Geyser Basin ACEC. BLM also funded hydrological studies of factors affecting the decline of hot spring activity in the Steamboat Hills area. Since 1983, the ACEC has been under the terms of a Recreation and Public Purposes Act lease to Washoe County, for development of a day-use area focused on interpretation, research, and protection of the site (BLM 1983). With the cessation of geyser flow, park development is currently low priority with the County.

The Federal Highway Administration (FHWA), in conjunction with NDOT, manages resources on lands within the U.S. Highway 395 right-of-way. Surveys for Steamboat buckwheat within the right-of-way were conducted in June 1994. The results of these surveys will be used in designing the least damaging alternatives for highway expansion in the Steamboat Hills.

#### **J. Recovery Strategy**

The strategy for recovery that is detailed in the following stepdown narrative begins with the protection and management of the current habitat of Steamboat buckwheat. Recovery will be accomplished by protecting Steamboat buckwheat habitat from adverse physical and biological modifications of land managed or owned by the BLM, FHWA, NDOT, and private parties by establishing protective conservation easements, cooperative agreements, and comprehensive management plans over the entire range of the taxon.

A monitoring program is proposed that will collect, analyze, and map baseline and periodic data, necessary for assessing population trends and habitat condition. Specific information on plant ecology and habitat requirements is needed to determine the characteristics of a self-sustaining population of Steamboat buckwheat and the amount of habitat needed to support it well into the future. A research program is also recommended to study long-term limiting factors, genetic variation within the taxon, reproductive biology, and long-term effects of groundwater drawdown.

A public information and education program is also a key component of Steamboat buckwheat recovery. All recovery actions will be coordinated with landowners, agencies, and concerned members of the public through this process to promote support and cooperation among entities. Finally, recovery objectives for downlisting will be refined and revised, and the criteria necessary for delisting Steamboat buckwheat will be determined as new information becomes available.

## **Part II. RECOVERY**

### **A. Objective and Criteria**

The objective of this recovery plan is to improve the status of Steamboat buckwheat so that it may be reclassified to threatened status. Because so little information is available on this taxon, it is not possible to determine delisting criteria at this time. Future revisions of this recovery plan will identify delisting criteria and recommend tasks required to accomplish full recovery of Steamboat buckwheat.

Reclassification of Steamboat buckwheat to threatened status will be considered when: 1) Protective conservation easements, fee acquisitions, or land exchanges secure approximately 75 ha (185 ac) of occupied habitat currently under private ownership; 2) cooperative agreements are established for approximately 32 ha (80 ac) of occupied public lands and approximately 15 ha (37 ac) of occupied State highway easement lands; and, 3) cooperative management plans have been developed and implemented on all occupied habitat. Accomplishment of these criteria will effectively protect the existing population and habitat in the short term. These recovery criteria are preliminary and may be modified pending completion of research identified as tasks in this recovery plan.

Prior to implementation of any task recommended in this recovery plan, the lead Federal agency must comply with all applicable provisions of the National Environmental Policy Act and ESA. All necessary Federal, State, and local permits or authorizations must be obtained. Land owner permission must be granted if the activity is to

occur on private land.

## **B. Narrative Outline of Recovery Actions**

### **1. Protect Steamboat buckwheat habitats from adverse physical and biological modifications**

The entire population of Steamboat buckwheat is restricted to approximately 100-150 ha (250-375 ac) of private and federally managed lands. Comprehensive management of Steamboat buckwheat will require development of a range-wide protection strategy in cooperation with the property owners, the BLM, FHWA, NDOT, and other concerned or knowledgeable entities such as NDF, NNHP, and TNC.

#### **11. Seek cooperation and support of private land owners for habitat conservation and enhancement**

Recovery of Steamboat buckwheat will require the cooperation and support of land owners during the planning and implementation phases of the management plan. The Washoe County Assessor's records of property ownership indicate that at least four land owners may have Steamboat buckwheat on their properties.

##### **111. Negotiate conservation easements**

Conservation easements should be negotiated with willing land owners so that the entire Steamboat buckwheat population may be accessed for purposes of baseline inventory, long-term monitoring, research, and habitat restoration.

##### **112. Investigate options for exchange or purchase of properties with Steamboat buckwheat and its habitat with willing sellers**

Land owners with Steamboat buckwheat or its habitat on their properties should be contacted to discuss options for purchase or exchange of their properties for lands of equivalent fair market value. If interest is expressed by the land owners, options for exchange or sale of these properties should be investigated.

113. Exchange or purchase properties with Steamboat buckwheat and its habitat with willing sellers

If property owners are willing and land purchase or exchange is determined feasible, efforts should be made to expedite such actions. Acquisition of these areas may help to avoid future impacts on Steamboat buckwheat and its habitat that would occur as a result of construction or other development.

12. Develop cooperative Steamboat buckwheat management plan

A cooperative management plan for Steamboat buckwheat should consider the long-term and cumulative effects of existing, future, and potentially detrimental activities across the taxon's entire range and provide opportunities for participation by land owners, resource management agencies, industry representatives, and other interested parties. The ultimate goal of this plan should be development of mutually achievable goals providing for long-term protection and enhancement of the Steamboat buckwheat population, its existing habitat, and its potential habitat. The plan should also consider, where appropriate and feasible, reestablishment of plants in formerly occupied habitat.

13. Implement Steamboat buckwheat management plan

Implementation of a cooperative Steamboat buckwheat management plan should include coordination among and participation by all involved parties to ensure that management objectives are met throughout the species' range of distribution.

2. Determine Steamboat buckwheat biology and habitat requirements

Maintenance of a viable, self-sustaining population of Steamboat buckwheat well into the future will require: 1) Implementation of a monitoring program for gauging population trends and habitat conditions; and 2) new research on various aspects of the taxon's biology and habitat requirements.

## 21. Develop and implement a monitoring program

The monitoring program should include provisions for collection and analysis of baseline and periodic information on Steamboat buckwheat which would be used for assessing population trends and habitat condition. Recovery of Steamboat buckwheat is dependent upon a commitment from all involved parties for long-term, range-wide information collection. The monitoring plan should be developed by resource managers and biologists in cooperation with property owners, industry representatives, and other potentially affected parties. Access to all Steamboat buckwheat habitats would require the coordination and cooperation of land owners, industry, and Federal agencies. Monitoring activities should not deviate from the program developed in cooperation with these entities. If substantive changes to the program were deemed critical to the recovery of Steamboat buckwheat, affected parties would have to be contacted to ensure that the new work is not in conflict with other activities occurring in these areas.

### 211. Develop monitoring plan

The monitoring program should specify goals for data collection, mapping, and analysis of Steamboat buckwheat population trends and habitat conditions. In addition, a protocol should be developed which standardizes methods of data collection and facilitates evaluation of future population and habitat trends throughout the full range of distribution of Steamboat buckwheat. The sampling protocol should be developed by a team of individuals with experience in surveying Steamboat buckwheat.

### 212. Implement monitoring program

Once the plan is developed, it should be implemented. Implementation will entail collection and mapping of baseline information and periodic monitoring.

#### 2121. Collect baseline information

While Steamboat buckwheat has been periodically surveyed in portions of its range since 1982, the

resultant information does not provide an adequate baseline for gauging population trends. The most recent studies have focused on two areas: The SDC lease area and the U.S. Highway 395 right-of-way. There is no detailed information available regarding plant numbers or extent and condition of habitat in other areas. At a minimum, range-wide, standardized information on plant numbers, occupied habitat, potential habitat, and habitat condition should be collected as a baseline for future monitoring of populations and habitat trends.

#### 2122. Develop baseline map

The baseline map should identify distribution of the Steamboat buckwheat population; existing, potential, and former habitat; and other features such as land ownership or management status and location of facilities and roads. Map development could be accomplished through the use of Geographic Information System (GIS) technology employing a series of map overlays. Use of GIS technology would facilitate analysis of trends in population numbers and changes in habitat extent and quality.

#### 2123. Conduct periodic monitoring

Periodic monitoring would provide information on Steamboat buckwheat population and habitat status for use in assessing trends and recovery progress. All monitoring should be implemented by individuals with experience and/or training in the standardized field sampling protocol. Annual monitoring information should be incorporated onto the map base to facilitate analysis of annual trends.

### 22. Identify factors limiting long-term population viability of Steamboat buckwheat

Very little is known of the ecology of Steamboat buckwheat or factors which may limit long-term population viability. New



research would define limiting factors and help in development of management objectives contributing to recovery.

**221. Determine genetic variation in Steamboat buckwheat populations**

Genetic variation is the basis for potential evolutionary change in a taxon and is related to a population's ability to survive range-wide environmental, demographic, or genetic disturbance (Huenneke 1991). At present, there is no information available regarding genetic variation in the Steamboat buckwheat population. An important aspect of recovery is an understanding of genetic variation within a population and how it may be influenced by external factors.

**222. Determine Steamboat buckwheat breeding system**

There is very little information available regarding the breeding system of Steamboat buckwheat. Information is needed on pollination biology, seed production, seed viability, and asexual propagation. Determination of the breeding system in Steamboat buckwheat is an additional step in understanding the genetic diversity of the population.

**223. Determine characteristics of a viable population**

A study should be conducted to determine the characteristics of a self-sustaining Steamboat buckwheat population and the size of the habitat necessary to maintain such a population.

**224. Evaluate the long-term effects of groundwater drawdown on Steamboat buckwheat habitat**

Since the siliceous materials which break down to sinter and provide substrate habitat for Steamboat buckwheat have not been deposited above-ground since the hot springs system ceased flowing in 1989, new substrates for Steamboat buckwheat are not being produced. A study is needed to determine the rate of weathering and associated soil development of the existing sinter substrates. This study should quantify the duration under

which the sinter will persist in the Steamboat Hills area. Information gained from this study would be useful in understanding the effects of shallow thermal reservoir drawdowns and associated loss of hot spring activity on Steamboat buckwheat habitat. If potential adverse effects are identified, appropriate measures should be taken to ameliorate those effects.

### 3. Provide public information and education

Recovery of Steamboat buckwheat will be dependent, in part, on the interest and willing cooperation of the private property owners and other members of the local community. An effective outreach program would help to deter negative sentiment for the recovery process and create an avenue for involvement and support among property owners, other members of the public, and the resource management agencies.

#### 31. Develop and implement participation plan

A participation plan should be developed and implemented to involve appropriate agencies and property owners in the recovery process. The involved parties should be continually involved in and updated on all aspects of the recovery effort. This plan should provide the basis for cooperation among interested and affected parties, and should address Steamboat buckwheat recovery needs as well as economic and other concerns.

#### 32. Develop and implement outreach program

A public-outreach program should be developed and implemented to inform and update local governments and interested members of the community of Steamboat buckwheat recovery efforts. Appropriate avenues (e.g., public meetings, newspaper articles, interpretive displays, etc.) should be identified and developed to disseminate information on the status and habitat requirements of Steamboat buckwheat and actions needed to recover the species.

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### Part III. IMPLEMENTATION SCHEDULE

This implementation schedule outlines actions and estimated costs for the recovery of Steamboat buckwheat. It is a guide for meeting the objective discussed in Part II of this Recovery Plan. This schedule indicates task priorities, numbers, and descriptions; duration of each task; responsible agencies; and estimated costs. These actions, when accomplished, should bring about the recovery of Steamboat buckwheat and protect its habitat. It should be noted that the estimated monetary needs for all parties involved in recovery are identified and, therefore, this schedule reflects the estimated financial requirements for the recovery of this species.

Additional (to-be-determined) expenditures for on-the-ground recovery actions will be identified after initial recovery actions are complete. Federally funded recovery actions will proceed in accordance with congressional appropriations for recovery of endangered and threatened species, which are allocated and prioritized on an annual basis. Some of the expenses associated with recovery of Steamboat buckwheat may be supported through the fund-raising activities of non-government organizations.

In the implementation schedule, tasks are arranged in priority order. The assigned priorities are defined as follows:

Priority 1 -- Short-term actions that *must* be undertaken to prevent extinction or to prevent Steamboat buckwheat from declining irreversibly in the *foreseeable* future.

Priority 2 -- Long-term actions that *must* be undertaken to prevent a significant decline in Steamboat buckwheat population distribution or size, or habitat quality, or some other significant negative impact short of extinction.

Priority 3 -- All other actions necessary to meet the recovery objective.

The following abbreviations are used in the implementation schedule:

Task Duration:

Continuous The action will be implemented continually once initiated.

**Responsible Party:**

<b>*</b>	<b>Lead Agency</b>
<b>FWS</b>	<b>U.S. Fish and Wildlife Service</b>
<b>BLM</b>	<b>U.S. Bureau of Land Management</b>
<b>FHWA</b>	<b>Federal Highway Administration</b>

<b>Cost</b>	<b>Estimated cost of task from start to finish.</b>
<b>TBD</b>	<b>To be determined at a later date.</b>

# Recovery Plan Implementation Schedule for Steamboat buckwheat

Priority Number	Task Number	Task Description	Task Duration (Years)	Responsible Parties	Estimated Cost (\$1,000's) 1996-2000	Cost Estimates (\$1,000's)				
						FY 1996	FY 1997	FY 1998	FY 1999	FY 2000
1	111	Negotiate conservation easements	1	FWS*	18	18				
1	112	Investigate options for exchange or purchase of properties with willing sellers	1	FWS*	18		18			
1	113	Exchange or purchase properties with willing sellers	TBD	FWS*	TBD	TBD	TBD	TBD	TBD	TBD
1	12	Develop management plan	1	FWS* BLM FHWA	24 6 6		24 6 6			
1	13	Implement management plan	Continuous	FWS* BLM FHWA	TBD TBD TBD	TBD TBD TBD	TBD TBD TBD	TBD TBD TBD	TBD TBD TBD	TBD TBD TBD
1	31	Develop and implement participation plan	Continuous	FWS* BLM FHWA	24 7 7	12 3 3	3 1 1	3 1 1	3 1 1	3 1 1
<b>COST NEED 1: PROTECT FROM ADVERSE MODIFICATIONS</b>					<b>110</b>	<b>36</b>	<b>59</b>	<b>5</b>	<b>5</b>	<b>5</b>
2	211	Develop monitoring plan	1	FWS* BLM FHWA	12 3 3	12 3 3				

Priority Number	Task Number	Task Description	Task Duration (Years)	Responsible Parties	Estimated Cost (\$1,000's) 1996-2000	Cost Estimates (\$1,000's)				
						FY 1996	FY 1997	FY 1998	FY 1999	FY 2000
2	2121	Collect baseline information	2	FWS* BLM FHWA	4 4 4		4 4 4			
2	2122	Develop baseline map	1	FWS*	20			20		
2	2123	Conduct periodic monitoring	Continuous	FWS* BLM FHWA	TBD TBD TBD	TBD TBD TBD	TBD TBD TBD	TBD TBD TBD	TBD TBD TBD	TBD TBD TBD
2	221	Determine genetic variation in population	2	FWS*	24		24			
2	222	Determine breeding system	2	FWS*	24		12	12		
2	223	Determine characteristics of a viable population	2	FWS*	24				12	12
2	224	Evaluate long-term effects of groundwater drawdown on habitat	1	BLM*	24			24		
<b>COST NEED 2: DETERMINE BIOLOGY AND HABITAT REQUIREMENTS</b>					<b>146</b>	<b>18</b>	<b>48</b>	<b>56</b>	<b>12</b>	<b>12</b>
3	32	Develop and implement outreach program	Continuous	FWS* BLM	24 7	12 3	3 1	3 1	3 1	3 1
<b>COST NEED 3: PROVIDE PUBLIC INFORMATION AND EDUCATION</b>					<b>31</b>	<b>15</b>	<b>4</b>	<b>4</b>	<b>4</b>	<b>4</b>
<b>TOTAL COST</b>					<b>287</b>	<b>69</b>	<b>111</b>	<b>65</b>	<b>21</b>	<b>21</b>



## **Part IV. APPENDICES**

- A. Summary of Comments**
- B. List of Reviewers**

## **A. Summary of Comments**

The Technical/Agency Draft Recovery Plan for Steamboat buckwheat was made available for public review, as required by the 1988 amendments to the Endangered Species Act of 1973, as amended (ESA). The public comment period was announced in the Federal Register on November 30, 1994, and closed on January 30, 1995. An announcement was also made in the Reno Gazette-Journal on December 25, 1994. Copies of the Draft Plan were sent to appropriate Federal, State, and local agencies, industry representatives, and private landowners. Copies were also provided to qualified members of the academic and scientific community for peer review.

Written comments on the plan were received from the Bureau of Land Management, The Nature Conservancy, two property owners, and two other individuals. These comments were considered in preparation of this final recovery plan, and incorporated, as appropriate. This section consolidates, summarizes, and provides the Fish and Wildlife Service's (Service) response to *significant* comments *not* addressed by changes in the text. Specific comments that reoccurred in the letters are addressed only once in this section. All letters of comment on the Draft Plan are on file in the Nevada State Office, Reno, Nevada.

**COMMENT:** It would be desirable to reclassify Steamboat buckwheat long before the year 2000.

**RESPONSE:** It will be possible to reclassify Steamboat buckwheat before the year 2000, if the recovery actions outlined in this plan are accomplished ahead of schedule, or if new information reveals that not all of the recommended recovery actions are needed for reclassification.

**COMMENT:** The 30-year lease by Steamboat Development Corporation (SDC) for development of geothermal resources is restricted to the use of the resource not the use of the land. SDC has no authority to enter into an agreement with The Nature Conservancy to preserve the Steamboat buckwheat on the lease site.

**RESPONSE:** The lease between the Steamboat Development Corporation and Towne/Fleetwood Corporation for use of the property provides for generation of electricity, together with other rights to ensure development, construction, and operation of the electrical generating facilities on the

property. The lease further asserts that SDC obtain and maintain all permits, licenses, and government approvals necessary for conduct of their activities. The agreement to preserve Steamboat buckwheat was developed in response to this requirement. In carrying out Steamboat buckwheat recovery actions, the Service will work with the parties to the lease to ensure that such actions are in accordance with the terms of the lease.

**COMMENT:** A recovery priority of 3 for Steamboat buckwheat (indicating a high degree of threat but high potential for recovery) may be too low, given that land exchanges that would have benefited the species were never accomplished.

**RESPONSE:** The recovery priority will be updated as needed, after recovery implementation has commenced and the Service has gained an understanding of the impediments to successful recovery of the species.

**COMMENT:** There are over 250 species of buckwheat in North America, therefore Steamboat buckwheat should not be protected.

**RESPONSE:** While there are many other types of buckwheat, Steamboat buckwheat is a taxonomically distinct variety of buckwheat found nowhere else in the world. The ESA, through the process of listing as threatened or endangered, provides protection for species and subspecies (including varieties) of plants and animals that are imperiled by human activities.

**COMMENT:** Altered andesite buckwheat (*Eriogonum lobbii* var. *robustum*) does not need protection and should not be discussed in this plan.

**RESPONSE:** Altered andesite buckwheat is a species of concern to the Service. Although it is known from many other locations in western Nevada, it's habitat has been damaged by off-road vehicle use and other activities. While species of concern do not receive legal protection under the ESA, the Service has a policy to develop and implement recovery plans that include protective measures for species of concern that occur in association with listed species.

**COMMENT:** The estimates for number of Steamboat buckwheat plants are inaccurate.

RESPONSE: The estimates provided in the Draft Plan are derived from existing studies and reports on Steamboat buckwheat. The recovery plan has been revised to better reflect the uncertainty associated with the population estimates. The Service acknowledges the need for additional information on plant numbers and habitat size. Some of the tasks proposed in this plan will provide new information on plant numbers.

COMMENT: A breakdown of the number of plants on public land, private land, and the Highway 395 right-of-way would be useful.

RESPONSE: These numbers are not currently available. If successfully implemented, the Steamboat recovery plan would provide the opportunity to collect this type of information.

COMMENT: The plan is erroneous in stating that the hot springs in the Steamboat area ceased flowing in 1989 because now there is spring activity, surface flows and additional geyser activity.

RESPONSE: To the best of our knowledge, natural surface flows at the hot springs have not been documented in the area since 1989. Observations of surface flow may be attributable to a cracked well casing during the period 1992-1993, which resulted in emergence of geothermal waters at ground surface.

COMMENT: Steamboat buckwheat can be successfully transplanted to containers or to other areas, and have demonstrated ability to flower and produce seed in a greenhouse. It also appears that seeds can be germinated elsewhere. Therefore, the plant should not be listed as endangered.

RESPONSE: The ESA requires that the recovery process address long-term survival for the species of concern *within their natural habitats*, rather than in greenhouses or zoos. The information available so far suggests that long-term survival of Steamboat buckwheat is not possible without the sinter substrates derived from the hot spring deposits. The Recovery Plan will be revised accordingly if it is determined that the plant grows naturally outside of the hot springs area.

COMMENT: Steamboat buckwheat is apparently restricted to hot spring soil habitat, does not survive or reproduce in a natural state, and may already be a doomed species.

**RESPONSE:** In the absence of surface flows from the hot springs, the sinter substrates that Steamboat buckwheat grows on will gradually decline in both quality and quantity. Over the course hundreds or thousands of years, suitable habitat may eventually be lost. The purpose of this recovery plan is to protect existing sinter habitat and restore degraded habitats that could also support Steamboat buckwheat.

**COMMENT:** The reasons for listing the species in 1986 (vulnerability to habitat alteration, off-road vehicle use, dumping, moisture pattern alterations) are not valid today.

**RESPONSE:** Off-road vehicle use and dumping have been largely eliminated through fencing. Habitat alterations through land development (e.g. construction) and moisture pattern alterations (e.g. changes in run-off due to the presence of roads or other structures) are ongoing, and may adversely affect the Steamboat buckwheat and its habitat.

**COMMENT:** There is no proof that individual plants have been damaged or destroyed through vehicular access to various facilities in the plant's habitat.

**RESPONSE:** The wording in the recovery plan has been revised to indicate that damage or destruction of individual plants by vehicles is a potential threat.

**COMMENT:** If highway construction is to be permitted, then other construction activity in the area should be permitted as well.

**RESPONSE:** The Federal Highway Administration (FHWA) and the Nevada Department of Transportation (NDOT) are required by the ESA to ensure that their actions do not jeopardize Steamboat buckwheat. In the past, FHWA and NDOT have modified their project proposals to minimize adverse effects on Steamboat buckwheat. If highway construction is proposed in Steamboat buckwheat habitat that would result in major adverse effects on the species, the Service will require these agencies to develop appropriate mitigation strategies to offset the adverse effects. Similarly, on private lands, the Nevada Division of Forestry requires appropriate protection measures be in place prior to issuing a permit to disturb Steamboat buckwheat. To date, no development activities have been stopped as a result of Steamboat buckwheat. If future development is proposed on private land requiring Federal permits or authority, the Service will work with the permitting

agency to develop reasonable and prudent alternatives or measures to minimize disturbance of Steamboat buckwheat and its habitat.

**COMMENT:** Future activities with the potential to directly disturb Steamboat buckwheat are not adequate justification to classify the species as endangered.

**RESPONSE:** In determining whether or not a species should be listed as threatened or endangered, the ESA requires evaluation of both present and potential destruction or modification of habitat. In the case of Steamboat buckwheat, potential habitat destruction was one of the identified factors that resulted in listing of the species.

**COMMENT:** Steamboat buckwheat should not be listed under the ESA because critical habitat was not identified.

**RESPONSE:** The ESA does not require identification of critical habitat concurrent with listing of a species.

**COMMENT:** Authorization has not been provided by the property owner to collect seeds from any portion of the SDC lease site, other than from within the 15-acre plant site. The landowner will prosecute all trespassers.

**RESPONSE:** Permission would be obtained from the responsible parties of the lease, as appropriate, to access private property within the lease site.

**COMMENT:** Reclassification considerations are onerous, unnecessary, overreaching and probably unconstitutional. The government cannot take and use land without compensating the owners for the takings.

**RESPONSE:** Reclassification tasks are limited to actions perceived necessary to protect and recover Steamboat buckwheat. The Recovery Plan does not recommend tasks that will result in property takings. The Service hopes to work with willing property owners to acquire Steamboat buckwheat habitat through land purchase or exchange.

**COMMENT:** Past protection efforts of other endangered species have often resulted in punitive action taken against property owners whose failure in recognition of a plant or animal under protection, or its habitat, has led to their arrest.

**RESPONSE:** The extent of protection for endangered species under the ESA differs for plants versus animals. For plants, it is unlawful to damage or destroy an endangered species in knowing violation of a state law. Under Nevada state law, a permit must be obtained prior to disturbance or destruction of Steamboat buckwheat. One objective of the recovery plan is to gain property owner cooperation in protecting Steamboat buckwheat. Such cooperation would assist the property owner in protecting the Steamboat buckwheat, while also providing for other land uses. Such cooperation could also ensure that unlawful activities resulting in legal actions against the property owner do not occur.

**COMMENT:** Protection efforts should be limited to the existing agreement between The Nature Conservancy and Steamboat Development Corporation, and transplantation of plants found along the rights of way of Highway 395 and other public and private roads, or other lands, if the owner is agreeable. No action should be taken to purchase property on the east side of highway 395, and abandonment of plans for the county park should be considered.

**RESPONSE:** The recovery plan recommends all reasonable recovery actions believed necessary to recover and protect the species. Recovery activities discussed in this plan involving private lands or private landowners would not be carried out without the voluntary cooperation of the private landowner.

**COMMENT:** Generation of electric power from the geothermal source should not be disrupted by protection efforts for Steamboat buckwheat.

**RESPONSE:** To date, protection efforts for Steamboat buckwheat in conjunction with geothermal development have been carried out in cooperation with the developers. In this manner, geothermal power development has continued in concert with protection for the plant. It should be possible to continue such cooperative ventures in all future development efforts.

**COMMENT:** The primary property owner does not anticipate spending any money for studies, reports, monitoring, research, or other activities related to Steamboat buckwheat.

**RESPONSE:** The Recovery Plan does not mandate expenditures by private landowners for recovery of Steamboat buckwheat.

COMMENT: The time and cost associated with recovery are too high to be funded by the taxpayer.

RESPONSE: Federally funded recovery activities could proceed only in accordance with congressional appropriations for recovery of endangered and threatened species, which are allocated and prioritized on an annual basis. Some of the expenses associated with recovery of Steamboat buckwheat may be supported through the fund-raising activities of non-government organizations.



## **B. List of Reviewers**

\* Indicates written comments received.

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